# The Air Line Pilot

September, 1954

**How Much Can a Pilot Do?**
**---Page 10**

**Crash Fire Hazard**
**---Page 12**

**Special IFALPA Section**
**—Pages 1-7—**

# IFALPA -- World Forum for Pilots

**As more and more decisions are made on the international level world-wide pilot cooperation assumes an increasing importance and value.**

By C. N. Sayen

*President, ALPA and IFALPA*

It is always interesting to note the similarity of the problems with which air line pilots all over the world are faced. For the pilot, the problems of Wendell Willkie's "One World" have been with us for some time.

Yesterday I picked up the telephone in my office and my good friend Captain Woodman, Chairman of the British Air Line Pilots Association, was on the wire. I inquired as to where he was and he replied that he was at the Chicago Midway Airport on a layover, having just flown in from Montreal. The last time I had seen Captain Woodman was at the 9th Conference of the International Federation of Air Line Pilots Associations in Zurich, Switzerland, in April and subsequently at the London office of IFALPA. Mr. Woodman came over to the Home Office in Chicago and we spent several hours talking over common problems related to flight time and on-duty time with which our Associations were currently confronted.

This incident is related in an attempt to demonstrate simply the extent to which pilot problems all over the world have become common problems. Captain Woodman flew into Chicago for BOAC in a Boeing Stratocruiser built in the United States. During his trip he had utilized the aviation facilities of Great Britain, Canada, and the United States. Very shortly pilots of Capital Airlines will be flying their routes in Vickers Viscount aircraft built in Great Britain. Air France pilots are currently flying in and out of Chicago in Lockheed Super-Constellations, and over some of their routes in British-built aircraft. Pan American currently has on order British Comet aircraft. Twelve air lines of the United States now fly international routes.

The national governments of most of the countries of the world, faced with a rapidly developing international commercial aviation and the resultant common problems, joined an organization to cope with them. This organization is now known as the International Civil Aviation Organization. It is an organization of member nations designated specifically to handle international aviation problems in accordance with the rules and regulations under which it operates. ICAO now maintains its home office in Montreal, Canada, where a full-time staff is employed. A large accumulation of international rules and regulations governing air commerce has now been adopted and is in a constant state of revision and improvement by the various working groups, committees, and through periodic conferences of the representatives of participating countries.

The commercial air lines of the world realized many years ago that the common problems they were facing in international aviation would require a focal point for solution. Therefore, in 1919 the International Air Transport Association was formed. This organization, composed of representatives of practically all of the air lines of all countries of the world (excluding Russia), is a clearing ground through which the managements of the air carriers may arrive at common solutions to their world technical and economic problems. The IATA is accorded observer privileges at ICAO.

Up until 1948 when the International Federation of Air Line Pilots Associations, the IFALPA, was formed, there was no provision for the "user viewpoint" or the air line pilot's view to be made known during ICAO deliberations or those of other international aviation forums. Thanks to IFALPA's growth and maturity, the voice of IFALPA is now accorded full observer privileges at ICAO sessions and the voice of the air line pilot may now be heard at these international conferences dealing with aviation problems.

An excellent example of the type problem which may be resolved on an international basis in the pilots' interest has been that of approach lights. This

*(Continued on Page 13, Col. 2)*

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Ed Modes, Editor

# 1954 IFALPA Zurich Conference

**Attendance at the 9th IFALPA Conference was largest yet with 98 per cent of the world's air line pilots represented there.**

**By Capt. W. J. I. Montgomery**

*Vice-President, IFALPA*

The Ninth IFALPA Conference was opened by Capt. L. Matthey, Vice-President of IFALPA, and after extending a welcome on behalf of the host Association, Aeropers, Capt. Matthey introduced Dr. E. Landolt, Mayor of Zurich, and Capt. F. Zimmerman, Operations Manager of Swissair. Mr. C. N. Sayen, President of IFALPA, responded, thanking the Mayor and Capt. Zimmerman for the warm welcome and he in turn welcomed the following observers to the Conference: Mr. F. Entwistle, International Civil Aviation Organization; Mr. C. H. Godfrey, International Transport Workers Federation; Mr. N. Veranneman, World Meteorological Organization, and Mr. G. Mayer of Germany.

In his Presidential Report, Mr. Sayen pointed out that the attendance at the Ninth Conference was the largest in the Federation's history in that 98% of the airline pilots outside Russia were represented. This would indicate the international interest in the welfare of the professional pilot.

Mr. Sayen reminded the meeting that last year he had described the airline pilot as the consumer of the advances in aviation. Whether it is the aircraft itself, component parts, procedures, navigational facilities, etc., he is the individual using the services. He is charged with monitoring the aircraft and all components, and as a result the pilot in command has final authority.

He pointed out that IFALPA should be kept strong and independent and press the pilot viewpoint. This may only be achieved by adequate representation. Representatives should be properly briefed and guard against expressing personal opinion rather than the opinion of their organizations. This is true of delegates from Member Associations as well as for delegations to international bodies.

## On the Cover

*C. N. Sayen, President of IFALPA and ALPA, delivers the Presidential Report to Delegates at the Ninth IFALPA Conference at Zurich. He stressed the need of IFALPA being truly responsible and truly representative. (L. to R.) Dennis Follows, Secretary; C. N. Sayen; and C. C. Jackson, Technical Secretary.*

Mr. Sayen called for strengthening of the individual organizations. He feels pilots should be more active politically to further the pilot viewpoint.

In closing he pointed out two requirements IFALPA must maintain in order to be respected:

1. We must be responsible, and
2. Truly representative.

The Credentials Committee reported documents in order from the following Associations: Australia, Belgium, Canada, Denmark, Finland, France, Holland, Holland-International, India, Ireland, Italy, New Zealand, Rhodesia, South Africa, Sweden, Switzerland, the U.K. and the U.S.A.

The IFALPA Secretariat members present were Mr. D. Follows, Capt. C. C. Jackson and Mrs. E. S. Ward.

The officers elected for the coming year:

President—Mr. C. N. Sayen (re-elected) of ALPA

Vice-President—Capt. W. J. I. Montgomery of CALPA

The venue of the 1955 Conference is to be Montreal, Canada, and the dates selected are April 14th to 20th inclusive.

The following motions were carried

and ratified by the 1954 Conference:

**Recording of Flight Time**

WHEREAS this Federation considers that all time spent during flight by a pilot engaged in commercial air transportation contributes to his aeronautical experience irrespective of the duties on which he is engaged; and

WHEREAS certain duties undertaken during flight time enable the pilot to qualify for specialist licenses or to maintain his proficiency in corresponding duties;

THEREFORE BE IT RESOLVED THAT

1. all time spent by the pilot as a member of the operating crew shall be logged as pilot time irrespective of the duties on which he may be engaged during flight time, and in addition thereto
2. any time spent in specialist duties during the flight shall be separately recorded.

**Performance**

WHEREAS there is considerable conflict of opinion concerning the concept of rational performance; and

WHEREAS the entire policy of international airworthiness standards is being reviewed;

THEREFORE BE IT RESOLVED THAT the Federation give its wholehearted support to the continuation and extension of study and practical evaluation of rational performance concepts and in this way facilitate reaching agreement on an international airworthiness code.

During the interim period the Federation, through its member organizations, should continue to remedy deficiencies and anomalies—where such exist—in the members' national codes of performance, using information available to IFALPA at this date.

**Maintenance of Performance**

during the interim period between the present time and the production of a new performance code.

WHEREAS the performance of any aircraft engine combination is subject to large variations; and

WHEREAS a code of performance must include a variety of variables; and

WHEREAS a reduction in the variables simplifies their numerical application to performance;

THEREFORE BE IT RESOLVED THAT this Federation press strongly for strict compliance with ICAO Annex 8, Part III, para. 5.2.1.4-A, and 5.3.1.5 which read—

"POWER INDICATION.

The engine shall incorporate provision for the installation of a device capable of indicating to the pilot, during flight, any change in the power output of the engine"

and, moreover, the Federation firmly recommend a substantially lower tolerance in the power output of new and overhauled engines in order that the intent of Annex 8, Part II, para. 4 regarding maintenance of continued airworthiness may be achieved.

**Performance**

WHEREAS visual reference is essential for the final stages of a precision instrument approach to land, and necessitates the provision of visual aids including an efficient approach lighting system integrated with adequate runway lighting and marking; and

WHEREAS under present operating conditions a minimum period of the order of 20 seconds is required from the point of break through or point of transition to the runway threshold* in order to achieve a visual landing at the end of the instrument approach; and

WHEREAS during this minimum period of 20 seconds the pilot is required to—

(a) effect a transfer from instrument to visual flight;

(b) appraise the situation and take any corrective action necessary;

(c) dissipate excess speed, and complete any requisite cockpit action; and

WHEREAS there is a distinct relationship on the one hand between the operating minima and the length of the runway needed for a landing, and on the other hand between the approach speed and the length of the runway needed for a landing; and

WHEREAS the immediate effect of a lower approach speed is to shorten the runway distance required while if the runway distance remains constant lower operating minima may be used and, conversely, an increase in the approach speed raises the operating minima for a given length of runway whilst for given operating minima a longer landing distance is required;

NOW THEREFORE BE IT RESOLVED THAT this Federation invite ICAO through the medium of its contracting States, to initiate further studies, including the collection of statistics on bad weather landings, to establish the relationship between—

(a) approach speed and landing distance; and

*Note: The threshold is defined as a point 750 feet downwind from the ILS GLIDE PATH reference point.

ICAO reference—DOC. 7151 OPS/609,1951. Pages 79 (ILS Clearance diagram) and 97 (Diagram System 2).

THE ROSTRUM: (L to R) Mrs. E. S. Ward; Dennis Follows, Secretary; C. N. Sayen; C. C. Jackson, Technical Secretary; and Jerome Wood, First Vice President of ALPA.

(b) minimum ceiling and visibility and landing distance; landing distance being defined as the distance between the landing threshold and the end of the landing run.

### Flights Under Instrument Flight Rules and Visual Flight Rules

WHEREAS the Federation is agreed that visual means for avoiding other aircraft can no longer be regarded as adequate; and

WHEREAS it is conscious of the great practical difficulties to be overcome before reaching a solution to the IFR/VFR problem;

THEREFORE BE IT RESOLVED THAT attention be drawn to the following:

1. Narrowing the present wide range of aircraft speeds in control zones by declaring a 'control zone speed' for each type of aircraft. Every effort should be made to minimize the spread of these declared speeds.
2. The need for airborne radar, preferably with automatic warning, to prevent midair collisions should be more widely recognized and the most urgent demands made for its rapid development for this purpose.

### Non-Inflammable Hydraulic Fluids

WHEREAS this Federation wishes to give impetus to the development and use of non-inflammable hydraulic fluids:

THEREFORE BE IT RESOLVED THAT member organizations forward to IFALPA Headquarters particulars of their operational and research experience with such fluids with the view to an exchange of such information between member organizations.

### Ship to Aircraft Communication

THAT this Federation expresses its concern that there are no ready means of direct communication aircraft to ship and ship to aircraft. It therefore requests ICAO to co-ordinate trials using HF, VHF or other means of communication so that specific recommendations may be made to eliminate that deficiency.

During the present unsatisfactory period and whilst the situation is being resolved, the Federation recommends that such equipment shall be installed in ships as will enable distress messages to be exchanged with aircraft. On receipt of such messages, ships should be able to transmit signals on some specified frequency for homing purposes.

**DISCUSSION: An animated discussion between sessions. L. to R.: Dr. E. Landolt, Mayor of Zurich; C. N. Sayen, and R. G. P. Andrews, President of Australian Air Line Pilots' Association.**

### Airborne Radar Landing Aid

WHEREAS new developments are now taking place in the field of airborne radar, enabling a high degree of discrimination to be attained; and

WHEREAS, by using such equipment, considerable advance may be possible in overcoming the low-visibility landing problem;

THEREFORE BE IT RESOLVED THAT every encouragement be given to the studies being undertaken by member organizations and by IFALPA headquarters and that authorization be granted to promote the early development of such equipment by means of publicizing the interest of the pilot and by direct co-operation with appropriate manufacturers.

### Search and Rescue

WHEREAS certain misgivings have been expressed about the effectiveness of ICAO procedures with regard to the collection and dissemination of information concerning search and rescue operations; and

WHEREAS studies and analyses of search and rescue incidents are a necessary preliminary action to secure the establishment of efficient search and rescue services;

THEREFORE BE IT RESOLVED THAT ICAO be invited to attempt to secure from its Contracting States more effective reports of search and rescue incidents in accordance with Recommendation No. 2 of the Third Session of the SAR Division 1951 and that such reports be supplemented by detailed information obtained from reports of aircraft accidents, summaries being prepared and disseminated periodically and independently of the ICAO Aircraft Accident Digest.

### Siting of ILS Marker Beacons

WHEREAS the location of ILS Marker Beacons is not a matter of urgency due to ICAO schedules;

THEREFORE BE IT RESOLVED THAT this matter be referred back to Study Group level for consideration at a later date.

### Siting of VOR Stations

THAT where the siting of a VOR station at an airport in an undeveloped region does not prejudice its function as a navigational aid, then this Federation desires the VOR station to be sited in a place which is best suited to facilitate approach, provided that such siting may be practicable from the technical point of view.

### Aerodrome Obstructions and Obstruction Lighting

WHEREAS this Federation has become aware that there are deficiencies of obstruction marking and lighting in the vicinity of and on aerodromes in many parts of the world;

BE IT RESOLVED THAT member organizations be asked to draw attention to the existence of any such deficiencies to the appropriate Govern-

*(Continued on page 14)*

# The Secretariat and Its Functions

## The Secretariat Provides the Administrative Set Up for IFALPA

By J. D. Follows
*Secretary, IFALPA*

Article IV of the Constitution and By-Laws of IFALPA provides that any Association representing airline pilots and whose purposes are aligned substantially with those of the Federation is eligible for affiliation.

The clause of the Constitution was so framed after considerable discussion which revolved round the principle of whether membership of the Federation should be on a state basis or not. As this clause indicates, the final decision was that membership should not necessarily be on a state basis, and the decision was reached largely as the result of the effective pleading of Captain Vickerstaff of the then newly formed KLM International-Pilots Association, who was later to become President of the Federation. Inevitably membership of the Federation tends to be on a state basis but there have been two countries, namely Sweden and Holland, who have had two members each. The Air Carrier Pilots Association is now defunct, but the KLM International-Pilots Association continues in good strength.

### The Governing Body

There were thirteen founder members of the Federation, whose membership dates from the initial Conference in London in April, 1948, at which the Federation was founded — since then new members have joined and to date the Federation's membership numbers twenty-one.

The governing body of the Federation is the Conference of Directors which normally meets annually in the month of April. Each member organization is entitled to three delegates to the Conference including the Director.

It is at this annual meeting that the work of the previous year is reviewed and the policy for the future is determined.

Conferences until 1952 lasted four days. Since then they have taken five and the 1955 Conference to be held in Montreal, is scheduled to last six days—in itself an indication of the growth of the Federation and its increasing activities. Much of the work has, of late, had to be done in subcommittee.

Resolutions passed at the Conference are ratified immediately and automatically become Federation policy. Any Director, however, has the right to withhold ratification on behalf of his organization and if he does, the resolution is held up for 90 days pending notification from the member organization concerned whether during the intervening period they have changed their views concerning ratification. If the organization maintains their opposition to the resolution, it comes up again at the next following Conference where a straight vote will determine its fate. If the organization does not persist in withholding ratification, it becomes Federation policy at the end of the 90 days period.

Each organization, except those with over 1,000 members, has an equal vote and it is interesting to note that over the nine Conferences of the Federation, no organization has ever considered it necessary to call for a roll call vote. An excellent spirit of give and take prevails throughout the discussions and it is rare indeed that an amicable and practical solution is not reached to all the problems which at one time may have seemed insoluble.

### Initial One-Man Staff

As stated in the Secretary's report to the IFALPA Zurich Conference, the administrative set-up of the Federation has been largely built up on enthusiasm, opportunism and improvisation. Secretarial duties at the inaugural London Conference in 1948 were carried out by the Secretary of the British Air Line Pilots Association, Mr. D. Follows, and Mrs. Ward of the BALPA staff. They continued to carry out these functions pending the next meeting of the Federation in Paris in September of the same year when the Constitution of the Federation was adopted, and the Headquarters of the Federation were fixed in London. Because of the limited finances of the Federation at that time—a state of affairs which is still with us—BALPA was requested to house the Secretariat and has continued to do so, Mr. Follows and Mrs. Ward acting as part time staff.

It was not long before the Federation began to take a deep interest in technical matters, and they were fortunate in having available a pilot in the person of Captain Jackson who was then flying with BOAC, who was keen and able to give secretarial assistance on the technical side. This he did to an increasing degree and when he had to give up airline flying owing to defective vision, he took on more and more of the technical work of the Federation. Initially this took the form of preparing briefs for the IFALPA representatives attending the various meetings to which the Federation was being invited as a result of achieving status at ICAO.

Ultimately in 1952 Captain Jackson joined BALPA and IFALPA as a full time employee sharing his time between the two organizations.

### Technical Work Organized

From that time the work on the technical side became more formal and organized. It was essential to secure pilot opinion on the widest possible scale in order to ensure that IFALPA representatives were fully briefed when attending ICAO meetings. Study Groups were then set up with members nominated by the various affiliated organizations to undertake a survey of the work usually covered by the Divisional and Regional meetings of ICAO. There is, therefore, in IFALPA at the present time some 15 study groups meeting at intervals at the Head Office to discuss a prepared agenda largely based on the future work programme of ICAO. Owing to increasing commitments in this connection IFALPA has recently offered Captain Jackson full time employment and it is hoped that he will be engaged solely on IFALPA work by October.

The IFALPA Secretariat will then consist of the Secretary, part time, the Technical Secretary, full time, one full time stenographer, and one part time stenographer, Mrs. Ward, whose duties by virtue of her long service cover a wide range.

This then is the functional side of IFALPA and when one looks back over the work of the last six years, one is amazed at what has been achieved and the reputation which has been established.

# IFALPA History and Background

## IFALPA Has Grown as World Barriers Have Been Swept Away and Aviation Has Expanded to an International Scope.

By Ed Modes
*Editor, The Air Line Pilot*

The International Federation of Air Line Pilots Associations is a product of the times—the universe-thinking scope of international aviation that is seeing more aviation policy being set and decisions made on the international level.

Unless you count the first commercial across-the-borders air service established from London to Paris in 1919, or the Florida-Cuba flights started in 1927, aviation was far more national than international in flavor until about 1939. In that year, the first transatlantic service was established.

During the war years, military urgency and allied cooperation swept away many political barriers and by 1945 the basis of a world-wide air network had been laid.

With an international air network established many pilot problems became world-wide and more and more international decisions affecting pilots were made.

### First Alliance in 1943

The first international pilot alliance was formed in 1943 between the Air Line Pilots Association, the British Air Line Pilots Association, and the Canadian Air Line Pilots Association. It was not actually a federation such as IFALPA. It was rather more in the nature of a mutual cooperation pact.

IFALPA itself was the product of an international conference of Air Line Pilots Associations held in London April 5-8, 1948. Here the concept of a global federation of Air Line Pilots Associations received its stimulus.

At this meeting, 13 air line pilot organizations, representing the pilots of 16 nations, signed an interim Memorandum of Federation as the first step toward the formation of IFALPA.

In addition to ALPA, air line pilot organizations and their representatives who signed the interim Memorandum of Federation were:

Australian Air Line Pilots Association, R. J. Ritchie; Association Belge Des Pilots et Navigateurs De Ligne (Belgium), R. Deppe; Canadian Air Line Pilots Association, Intercontinental, C. R. Robinson; Danish Air Line Pilots Association, G. C. McCarthy; Irish Air Line Pilots Association, Michael Cusack; Syndicat National Des Officiers De L'aviation Marchande (France), M. Castello; Dutch Air Line Pilots Association, J. J. Abspoel; the New Zealand Air Line Pilots Association, R. J. Ritchie; the Norwegian Air Line Pilots Association, Reidar Hartvedt; Pilots Association of Central Africa, J. C. Reynolds; Aeropers (Switzerland), Robert Fretz; the British Air Line Pilots Association, J. W. G. James.

FORERUNNER: First Pilot International Alliance—the ALPA-BALPA-CALPA Pact in 1943.

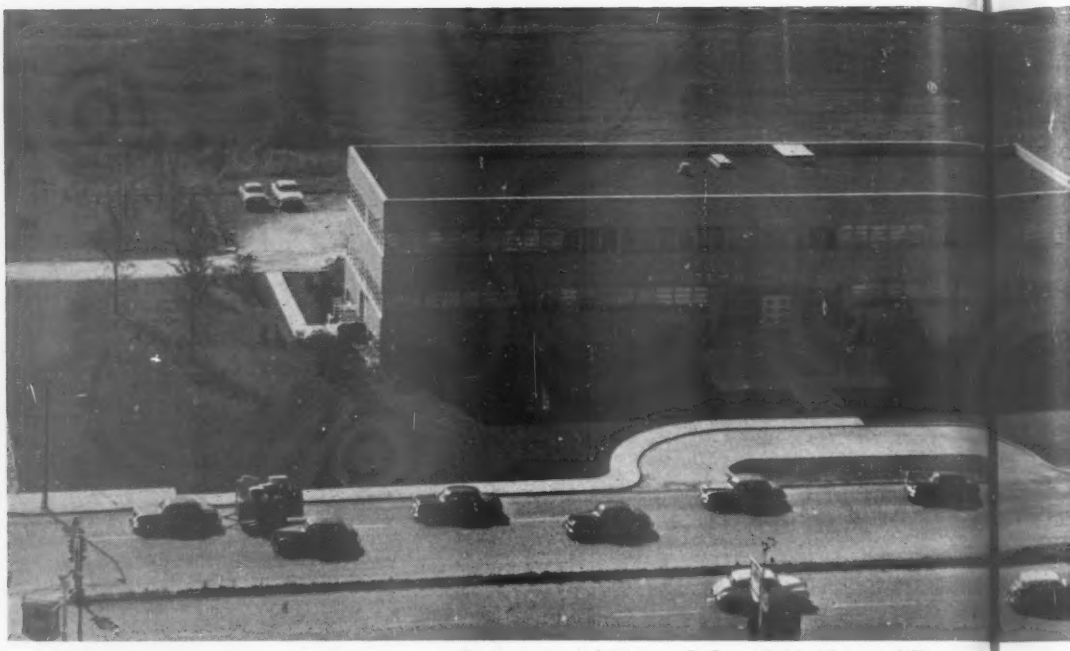
### First Memorandum

This Memorandum provided for: (1) Establishing methods of communication between the pilots' associations of different countries on matters of mutual interest; (2) insuring that the views of pilots' associations are made known to the proper international authorities; and (3) establishing a permanent organization through which the voice of the air line pilots will be magnified and strengthened and through which pilot objectives might be attained on an international scale. This merely laid the groundwork for the ultimate formation of a permanent union of this nature. A further meeting was held in Paris, France, in September, 1948, at which draft rules and regulations for the Federation, were approved. Meantime, the interim organization was set up with Headquarters in London and D. Follows, secretary of the British Air Line Pilots Association, was appointed as secretary of the Federation.

The late David L. Behncke was IFALPA's first president. C. N. Sayen

*(Continued on page 12)*

# Camera



. . . Latest Aerial View of the ALPA Home Office

UAL Negotiating
Committee Meets

ffice

TWA Negotiating Committee at Home Office

. . . Sixth Meeting of Nat'l Aviation Noise Reduction Committee

ILOT

# How Much Can a Pilot Do?

## Like Any Human Being, One Thing at a Time Says this Researcher. He Concludes: "The Amazing Thing Is Not Pilot Error—It's the Excellence of Pilot Success."

By L. I. O'Kelly

*University of Illinois*

Before starting to answer the question, I would like to express my obligations to Professor A. C. Williams, Director of the Aviation Psychology Laboratory of the University of Illinois, who has forgotten a great deal more about flying than I will ever know, to Dr. Guy Matheny, of Tyndall Air Base, who has patiently allowed me to serve as a colleague in some of his aviation research, and to Dr. Tom Payne, Director of Aviation Psychology Research Laboratory at the University of Maryland, whose flight instruction is at as high a level as his research ability.

The answer to the question which has been assigned as my topic in this discussion, "how much can a pilot do?," is among the most basic in any critique of cockpit procedures in relation to air safety. In fact, the effectiveness of instrument displays, control arrangements and procedure sequences is dependent upon the capabilities and limitations of the human operator. Consequently, much research effort of aviation psychologists has been directed towards the problem, and in this paper I would like to summarize some of the findings that most directly bear on the planning and evaluation of cockpit procedures.

### Two Related Questions

The question of "how much can a pilot do?" may be broken down into two related questions: (1) How many things in what length of time?, and (2) How long can he continuously keep doing those things that relate to his flight duties. Since I am sure that Captain Shapiro will have discussed the relation of the latter question to cockpit procedures in general, I will confine my remarks to the former, which is most immediately relevant to the analysis of individual procedural components.

The answer to this question, in its shortest and most reduced form, is: the pilot can do **one** thing at a time. On this point the evidence is unequivocally clear, although it is sometimes surprising and seemingly in contradiction to common observation that such should be the case. Let me give but one example: comprehension of an auditory message which is highly detailed and specific, containing such items as bearings, runway numbers, altimeter settings and the like, will be imperfect to the extent that the pilot must, during the transmission, undertake any other action sequence.

### Definition of Action

Since it may be taken as established that the human operator works on what might be called a "single circuit" principle, estimates of his capability must be based on knowledge of the duration or lapsed time for (1) specific actions, (2) spacing between action components, and (3) shifting from one type of action to another. In short, the pilot must be conceived as a mechanism that "shares time" between the various components of his duties. Thus, we must first establish a definite and workable notion of what constitutes an action, find out how many actions can be performed per unit of time, and then fit this basic knowledge into the realities of the cockpit procedure.

How can "action" best be defined? At the outset we can reduce possible confusion by introducing the term "transaction," and by defining a "transaction" as **a sequence of behavior involving a pattern of informal input, a decision and a set of related activities consequent to the decision.** The task of operating an aircraft is a set of such transactions, laid more or less end to end in time. Practically, what a transaction consists of is recognition of visual and auditory cues coming from the sources outside and within the plane, assimilating and judging them, and acting on the basis of them. When action is defined in this way we can give rather definite answers to the question, "how many things can the pilot do?," since the present importance of surveillance and monitoring devices has stimulated a good deal of research in the past few years.

Under ideal conditions, with the simplest type of inputs, the most routine decisions and the simplest consequent action, it appears that the maximum number of transactions is about 6 per second. Situations of this degree of simplicity are probably of rare occurrence as critical matters of cockpit procedure. The usual findings for somewhat more complex inputs, increased alternatives for decision and more involved actions are that the operator can handle about 1.5 transactions per second. Some aspects of the flight task, such as directional tracking of compass or gyroscope, monitoring power plant instruments with slight control corrections, might, under ideal conditions, fall into this bracket.

The above rates are about as far as we can go in stating maximal transaction speeds. Beyond this, we must analyze the variables acting in the particular situation before we can approximate definite specifications. The crucial element of the transaction is the **process of decision;** most of the time lapse for any transaction is consumed in decision-making, and it is upon the adequacy of the decisions that safety is chiefly dependent.

### Decision Involves Choice

Decision always involves choice among alternatives. The complexity of a decision is a direct function of the number of courses of action possible and known to the pilot. Insofar as it is possible to regulate such matters, procedures should be planned so that:

(1) When time is limited, the complexity of decisions required should be as low as possible.

(2) And, conversely, when complexity is unavoidable, time allowance should be large.

While it is true that emergency procedures cannot be completely forced into optimal time-complexity combinations, a number of concrete steps can

be taken in that direction. Since we are all too well aware that the expected frequency of emergencies is greatest during the very first and the last stages of a flight, the pilot should be freed as much as possible of transactions furnishing possible competition to the emergency transaction. Captain Shapiro's analysis of work-load distribution during flight, with its suggestions for definite advance planning and redistribution of some portions of the task are in accordance with these principles.

### Another Step

Another step towards securing optimal time-complexity relationships in emergency procedures may be taken by making careful critical tests of the largest time allowance for the safe execution of any emergency procedure. To quote from an earlier report of this matter: "It has been universally assumed . . . in carrying out emergency procedures, that the faster the sequence could be executed, the better. This can be questioned, since it is possible, and can be determined experimentally for most operations, that the optimum interval of time between units in that sequence is greater than the shortest possible time." Any crumb of time that may be saved for a given procedure allows more time for decisions, and also, more time for accuracy of execution.

### Transaction Nature Varies

The nature of a transaction varies as a function of the amount of training that has been invested in it. As proficiency increases, the number of elements that can be assimilated within a given transaction also increases. As a very common example, any pilot may recall his initial stage of contact with equipment of complexity greater than he hitherto had flown. Initial stages of practice involved a large number of small decisions and each manipulation required separate search. At more advanced stages of practice, the actual decisions required become much smaller, although the actual number of manipulations in all probability change very little. Thus, the "number of things" a pilot can do is dependent upon the level of practice he has achieved for the specific procedure in question. The important practical application of this type of research finding lies in its relation to the analysis of procedures we have just discussed. Cockpit procedure analysis should have as one of its very first goals and points of application, the training syllabus. The situation varies in different organizations, but it is not unusual for flight training centers to practice the student on one variant of a procedure and for the student to find subsequently that operational practice on the line may be substantially different. In our talks with line and school people, we sometimes find, in such a situation, that about the only evidence either group may have for their preference is personal opinion and a pretty good idea that CAA regulations are not being violated. Needless to say, such situations are exceptions and not the rule. If it is desired to maximize the safety and effectiveness of any procedure, training and operational practice must be coordinated.

Research has indicated that, for many purposes, the maximal amount of information, the most freedom from perceptual error, and the most reduction in over-all transaction-time, comes from correctly designed pictorial displays. To a lesser extent, design of control-knob shapes and planning of their cockpit location work in the same direction.

As a last set of factors to be considered in determining how much the pilot can do, we would survey some of the effects of stress or emotional pressure on the pilot and his procedures. For our present purposes we can say that most of the effects of pressure on the pilot can be understood by noting that fear or anxiety is a rather continuous transaction, and that its detrimental effects come because it takes up a disproportionate share of the pilot's time. Since to achieve a safe performance, the pilot must have a highly effective rate of time-sharing between many essential transactions, time devoted to apprehension, self-doubting and worry means less essential transactions in any given unit of time.

### Effects of Stress

Two main effects of stress tend to complicate optimal execution of procedures. Firstly, since the physical characteristics of the particular flight situation set definite time limits for the accomplishment of a transaction, the intrusion of the stress transaction tends to push the pilot into attempts to speed up his transaction rate. This leads to impulsive, ill-considered decisions and rough and erratic control manipulation. Check pilots have given us many vivid descriptions of all degrees of this influence, ranging from small deviations from optimal time, altitude or direction limits in basic instrument flying all the way to abandonment of the controls in blind panic under real or simulated emergency conditions.

A second effect of stress is a diminished capacity for receiving information. While riding as an observer on a crucial check-ride of a very experienced, but very worried and anxious pilot, I counted ten instances of relevant information given to the pilot which he did not see or hear in the period from run-up to establishment of cruising altitude. Preoccupation or worry about matters pertaining to the flight or to the pilot's personal life operate in the same manner. Because these transactions are more or less continuous, and because they usually have no decision-making and activity components that lead to their solution, they often happen to be the "one thing" that the pilot is doing at the time he should be receptive to something else.

### Either Cause or Effect

One can consider stress in relation to cockpit procedures from either the cause or the effect end. What we have just said represents some of the effects of stress. But procedures may also serve as sources or aggravations of stress reactions. All of these emotions which lead to deterioration of performance are brought about by the frustration or blocking of activities we are trying to carry out. To the extent that a procedural load exceeds the capacity of the pilot he is going to have stress reactions. Poor design of displays, inconvenience or inaccessibility of controls, inadequacies in heat, lighting, ventilation and noise-reduction, lengthy hours of vigilant flight activity—all of these factors are vectors in the production of stress, and all of these affect our answer to the question of how much the pilot can do.

While much more could be said in answer to the very challenging question the panel has asked, the foregoing are some of the most important variables. In summary, then, the human operator can, at any given instant of time, be occupied with but one transaction; he must share his time between competing demands; critical analysis of procedures must be based on knowledge of optima with respect to informational inputs, decision complexity, and consequent actions. Consideration of the human variables involved in safe flight leads me to a conclusion that the pilot must be as wise in decision as a good chess player and as correct in his tempo of transaction as a bull fighter. The most amazing thing to the student of aviation psychology is not pilot error, rather it is the excellence of pilot success.

# Crash Fire Hazard: A Report

## It's a Case Mainly of Too Little, Too Late. Equipment Is Inadequate, Far From Enough. An Air Safety Forum Report.

By Capt. Victor Hewes
*Delta—C & S*

ALPA Crash-Fire Committee has been making a study of aircraft crash fires and the means of preventing or fighting them. Today we would like to discuss some of the problems that have arisen during our many meetings with persons interested in airport safety.

First let us make one thing perfectly clear, that most aircraft fires can be extinguished if reached in time by experienced personnel with adequate modern up-to-date equipment. Many people do not believe this statement to be true, but we are convinced that if the crash has been such that occupants are still alive, then the fire can be controlled. Briefly what is required of a well equipped airport Crash-Fire Department? Depending on the size of the airport and the aircraft using it we will require up-to-date carbon dioxide equipment for the rapid extinguishing of a fire to be followed by ready-mixed high expansion foam to prevent reignition and enable rescue operations to be carried out. To operate this equipment, we will need adequate well-trained personnel.

A very complete and exhaustive research has been carried out by the many organizations interested in crash-fire fighting. The National Fire Protection Association, the NACA, Air Force and Navy experimental units are doing an outstanding work in this field constantly seeking to improve our methods of fire prevention and the extinguishment of aircraft fires.

Unfortunately, many of our commercial airports today have a certain reluctance to provide adequate fire fighting equipment and little or no effective fire protection is provided for passengers and crew members involved in a forced landing or involved in a fire when landing or taking off. The main reason for this is the fairly high cost and the problem of whom is to bear that cost. There is always much discussion concerning the responsibility of providing crash-fire protection. Many of the airport managers claim it is a function of the airlines altogether, as they are the prime users of the airports; however, the airlines claim the airport authorities should pay for it for the following reasons: The airport collects landing fees according to the gross weight of aircraft using the airport and should provide crash equipment appropriate to the size and weight of the aircraft using the airport.

The cost of a crash truck today is between $15,000 and $35,000 depending on size and type of crash and extinguishing equipment carried. A fireman's salary is a minimum of $4,000 per year. It can therefore be seen that manpower is the most expensive item. There are many ways to reduce the number of firemen needed on duty at any one time. Power turrets operated from the cab by the driver is one good example. Some of the firemen could be used for other duties such as ramp police and so help to divide the cost.

Many of the airports into which the commercial airlines operate are also used by the Air Force Reserve, National Guard or Navy. At every such airport very excellent crash equipment is provided. In some of our major commercial airports such as Washington, New York, Miami or Fort Worth to name a few, we find also that the local authorities have provided an adequate amount for crash-fire protection.

### Obsolete Equipment

The Crash Fire Committee has met with Airport Managers, Fire Chiefs and city officials throughout the country. At one large airport in the northeast currently being used by Constellation and DC-6 equipment there is one antique fire truck that has not been used for many years. In fact, it is covered with dust. The Fire Department consists of untrained and inexperienced mechanics and ground personnel of the airline. Most of the time the entrance to the Fire Department is completely blocked by heavy ramp equipment.

At one of the ten largest airports

# History of IFALPA

*(Continued from Page 7, Column 3)*

has been elected as president of IFALPA three times.

*Current member organizations of IFALPA: (Founder members marked (F))*

Australian Air Pilots' Association (F)
Association Belge Des Pilots et Navigateurs De Ligne (F)
Canadian Air Line Pilots Association (F)
Danish Aircrew Association (F)
Finnish Air Line Pilots Association
Syndicat National Des Officiers De L'Aviation Marchande (F)
Association of Greek Civil Aviation Flying Personnel
Dutch Air Line Pilots Association (F)
KLM International-Pilots Association
Indian Airline Pilots' Association
Irish Air Line Pilots' Association (F)
Italian Air Line Pilots Association
New Zealand Air Line Pilots Association, Inc. (F)
Norske Ruteflygeres Forening (F)
Air Line Pilots Association of the Philippines
Pilots' Association of Central Africa (F)
Skandinavisk Flyg Personal Forening
South African Airways Pilots' Association
Aeropers (Switzerland) (F)
British Air Line Pilots Association (F)
Air Line Pilots Association, International (F)

in the country there are three obsolete crash trucks. Two trained firemen per shift are on duty to handle them. At the time of our first inspection, even the hoses were full of holes. During discussion with the airport manager, he stated that there had not been a crash at his airport for the last twenty-five years and he saw no reason for having one in the future and he considered crash equipment a waste of airport profits.

### Enough Equipment?

At yet another airport we found one obsolete fire truck manned by two part-time firemen who also doubled as the airport Police Department, yet neither of the men had finished the third grade. This airport manager assured us that he had an up-to-date Fire Department equipped with foam. Our inspection revealed a small one gallon can. However, we were assured that this was enough to extinguish a fire on an airliner.

At one of our large airports, also one of the ten largest in the country, the airport Fire Department is a part of the city fire service with a large number of well-trained personnel available. However, they had one used crash truck sold to them at the end of the war by the Air Force for $1.00. The fire chief has twice requested new equipment from the city's Aviation Committee and has been turned down on both occasions. He was obviously concerned that in the event of a crash fire at his airport that he could not effectively control the fire.

### Some Questions

Many of the airport managers seem to resent any activities on our part to obtain new equipment, however, it was refreshing to be told by one manager that he would do everything in his power to obtain crash fire equipment if we would send him our specifications. Also the manager who said that the airlines provided such a large proportion of his city's trade that he would continue to provide the best protection available regardless of cost.

Should action be taken by the CAB to enforce minimum crash truck requirements? If such action were taken would it close down our smaller airports and put the feeder airlines out of business? Should ALPA take action to cease operations into airports without adequate crash equipment? These and other questions I leave for further study and determination.

# IFALPA---A World Forum

*(Continued from Page 2, Col. 3)*

Association has contended for many years that an air line pilot breaking out of the overcast on a low approach to an airport should be presented always with the same standardized information in the form of approach lights to align him and direct him to a safe landing on the runway. The Association has contended that such approach lights should be oriented along the center line of the runway extended in what has come to be called the ALPA Aproach Light System. We have contended that the pilot should receive such information whether he is making his landing at Chicago, Montreal, Shannon, London, or Tokyo. This problem was processed through the IFALPA in order that the pilots of most of the air lines of the world could come to a common solution on it. In 1952 at the 7th IFALPA Conference in Sydney, Australia, a resolution was adopted endorsing the center line approach light system as an international standard. In 1952 the IATA at its Conference in Madrid adopted the center line approach light system as an international standard. Subsequently, at Montreal in Fifth AGA of ICAO Oct. 21-Nov. 20, 1952, agreement was reached through ICAO and the center line system was adopted as an international standard for approach lights for all member countries.

This is not to say that we do not still have internal problems within the United States in regard to the standardization of approach light systems or that many countries are not having controversy and difficulty on that subject. However, the overall guiding principle has been agreed upon and progress should be made toward achieving that Utopian situation under which air line pilots breaking out of an overcast at any airport in the world will have standard, reliable information to lead them to a safe landing under minimum conditions.

It is imperative in the best interest of the professional air line pilot that an organization such as IFALPA exist and continue to grow. Such an organization serves manifold functions:

1. It provides a clearing house through which the air line pilots of the world may voice their opinions and contentions and, through orderly and democratic processes, arrive at a solution.

2. It provides a vehicle through which such common solutions once reached may be processed and the air line pilots' voice be heard at the international level on aviation problems.

3. It makes available the pilot or "user" viewpoint to international aviation forums. This is accomplished in an orderly, democratic manner in accordance with the procedures and processes set forth in the Constitution of IFALPA so that other aviation groups may rely on IFALPA decisions and recommendations as being representative of the pilot viewpoint.

4. It provides a clearing house for information by which cooperation and good will may be fostered among the air line pilots of the various countries of the world. It is a most stimulating and inspiring experience to sit in conferences with pilot representatives of the pilot organizations of more than 20 countries and come to unanimous conclusions after long, deliberative but friendly sessions.

5. It makes possible the maintenance of a trained and experienced staff and the organization of pilot working groups for the purpose of monitoring avaition developments and representing the pilot view.

6. It provides a common ground for discussions of social and economic, as well as technical problems.

7. It promotes international good will among professional pilots of many backgrounds.

Air line pilots rubbing shoulders at the world's international air terminals now have through IFALPA a common meeting ground and vehicle through which their problems may be processed.

While air transportation, both domestically and internationally, is becoming more competitive each year, such competition should not prejudice safety standards nor pilot standards. IFALPA can and should be a constant monitor and conscience in such matters pointing out to the world forums the needs of the pilot to do the most effective job of air transportation in the public interest.

I have pointed out many times and most recently in an address before the IFALPA Conference in Zurich in April

*(Continued on Page 15, Col. 1)*

# 1954 Zurich Conference

*(Continued from page 5)*

mental authority and at the same time advise IFALPA headquarters accordingly, with a view to subsequent notification to ICAO if the need should arise.

In the event of there being such temporary obstructions, or deficiencies in marking or lighting such obstructions, as would normally be notified to the pilot by Notam,

BE IT FURTHER RESOLVED THAT the Aerodrome Control Officer be instructed to advise the pilot of those obstructions or deficiencies by R/T prior to final clearance to land being given.

### Airborne Radar

WHEREAS aircraft accidents and incidents, where inability to avoid areas of turbulence and icing conditions are a contributory cause, continue at an alarming rate; and

WHEREAS accidents due to collision with mountain terrain continue; and

WHEREAS such accidents, in addition to the loss of life and property, undermine confidence in air transportation; and

WHEREAS it is the opinion of the Federation that accidents and incidents from these causes could have, in many instances, been avoided had the pilot had available airborne radar capable of providing storm detection and terrain information; and

WHEREAS it is the understanding of the Federation that such equipment has been and is now available;

FIRST AGREEMENT: The First Agreement of Federation Is Signed in London in 1948 by Pilots of 13 Nations.

THEREFORE BE IT RESOLVED THAT the Federation, collectively and through member organizations, insist strongly that airborne radar adapted to the specific purpose of providing the pilot with information to aid in:

1. turbulence circumnavigation;
2. evasion of icing areas; and
3. terrain clearance

be installed in commercial aircraft as soon as possible.

### Phonetic Alphabet

WHEREAS ICAO, in conjunction with certain of its Contracting States, is conducting a study on a revised phonetic alphabet; and

WHEREAS this study is part of a wider study on an international language for aviation; and

WHEREAS both studies are designed to facilitate air/ground communications and so contribute to safety;

BE IT THEREFORE RESOLVED THAT this Federation, both collectively and through its member organizations, participate in these studies to the greatest extent practicable with a view to the production of a phonetic alphabet that will receive a wide measure of acceptance.

BE IT FURTHER RESOLVED THAT in the meantime, member organizations take all possible steps to reduce to a minimum all confusion caused by the use of multiple alphabets and to that end,

BE IT FURTHER RESOLVED THAT member organizations be per-

GROWING: The Growth of IFALPA Was Evident in the Group Picture of the 1953 Conference.

mitted to make such use of the ICAO alphabet as they consider appropriate.

### Navigational Services in Undeveloped Regions

THAT at future Regional meetings, the Federation should aim, when expressing regional navigational requirements, at demanding only such aids as are essential to safe operation and which may be expected to be reasonably within the ability of the State concerned to provide.

In formulating these requirements in undeveloped regions, due regard should be paid to the desirability of raising the general level of radio navigation aids (e.g. the nondirectional beacon system) before emphasis is placed on the specialized aids such as ILS.

## A World Forum

*(Continued from Page 13, Col. 3)*

that some air line pilot utilizes practically every aviation facility, aircraft, aircraft component, navigational or communication device, procedure, etc., in the world every day. The pilots, therefore, represent the "consumer or user" viewpoint and are the greatest single source of information available on such matters. It remains only for such information to be sifted and processed through appropriate channels for it to become of great value. Similarly, the pilot bears a final responsibility to the traveling public. He must, therefore, effectively make his voice and opinions independently heard if he is to fulfill his responsibilities in good conscience to the traveling public who put their confidence in him. In these two primary responsibilities and functions, IFALPA is a constructive and necessary supplement to the pilot's own national organization. A united pilot viewpoint on a world level is and may remain a powerful force to cut across international differences and political tensions in the best interest of high and reasonable safety and pilot standards throughout the world.

## 13 Biennial Convention

*The ALPA Convention will be held at the Shoreland Hotel, Chicago, November 8-13.*

# Meet Your Vice-Presidents

JEROME E. WOOD

Jerome E. Wood, ALPA's First Vice-President since 1947, has announced in a letter to Mr. Sayen that he is retiring from active Association affairs and will not be a candidate at the coming Convention for reelection.

A member of ALPA since 1940 when he went to work for Eastern Air Lines, Jerry has served ALPA in one capacity or another every year during the past decade and a half. His activities on behalf of the air line pilots forms an impressive roster of accomplishments, serving first as copilot representative for his council, on many negotiating committees, as Council Chairman, as Master Chairman and finally as First Vice-President.

Through the years Jerry has always been found in the thick of battle. In 1944 he actively served in the Association presentation during the DC-3 gross weight hearings. He was active in the 4-engine pay rates negotiations, in 1946-47, seeking recognition of the larger, more productive equipment. Subsequently, in 1951 as chairman of the negotiating committee on Eastern Air Lines, he and his committee were in the forefront of accomplishment in the introduction of the increasing mileage pay formula.

Always intensely interested in air-safety matters and the international aspects of air line piloting, Captain Wood, in 1947 and 1948, served as a consultant to President Truman's Special Board of Inquiry on Air Safety, and in May, 1948, was chosen by the government as a member of the Commission which went to Germany to observe the Berlin Airlift operation to find possible procedures which could be adapted to domestic airline operations. More recently, Jerry has been active in ILFALPA, participating in the 1952 conference in Sydney, Australia, in the 1953 meeting in Chicago and in the 1954 conference in Zurich, Switzerland.

Jerry learned to fly in 1927 in Chicago in a OX-5 and to quote him, "I'm still learning." He received his commercial pilot's license in 1929, flew passengers and instructed through 1930 and, during the years 1931-39, operated his own aviation business with three tri-motors, one Ford and two Boeing 80-A's.

Active in the reorganization of ALPA in 1951, Jerry supported the reorganization vigorously while still carrying deep affection and sincere respect for Dave Behncke and his accomplishments for the air line pilot group. As Jerry states, "it is my fondest hope that some day an expression of that respect and affection will be forthcoming from the pilot group as a whole."

While continuing actively as an air line pilot, Jerry reports that he has undertaken active duty in a new phase of his life—that of a family man. Married and residing in Coral Gables, Jerry has two children and only recently became the proud possessor of a grandchild.

Following is Captain Wood's letter to President Sayen, announcing his decision to retire from Association office:

*"Just a line to let you know I will not be a candidate for reelection, or for any other Association office, at the coming Convention. I have reached this decision because:*

*"(a) I am convinced that under your capable leadership the organization is in the best shape and doing the best job for the membership since its inception, and that this will continue.*

*"(b) For nearly fifteen years I have spent at least 75% of my spare time in some form of Association work, and it has reached a point where there are things I must do in the interest of my family, which cannot be deferred much longer.*

*"I make this decision with deep appreciation to the membership which has repeatedly honored me by election to high office in the organization. I have been privileged to participate in helping solve most of the major problems faced by the Association during that time. It has given me an appreciation . . . second to none, of the value of the organization to the air line pilot. It has been worth every minute of the time and effort involved.*

*"Carry on!"*

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